

Mathematics of Business and Personal Finance

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| Levels: | Grades 10-12 |
| Unit of Credit: | Full year (1.0) |
| CIP Code: | 52.0311 |
| Core Code: | 32-01-00-00-001 |
| Prerequisite: | None |
| Skill Test: | #236 |

COURSE DESCRIPTION:

This course is designed to represent the standards of learning that are essential and necessary for all students. The implementation of the ideas, concepts, knowledge, and skills will create the ability to solve mathematical problems, analyze and interpret data, and apply sound decision-making skills. This will enable students to implement the decision-making skills they must apply and use these skills in a hands-on manner to become wise and knowledgeable consumers, savers, investors, users of credit, money managers, citizens, employees, employers, inventors, entrepreneurs, and members of a global workforce and society.

INTENDED LEARNING OUTCOMES

- Students will be able to build upon a foundation of basic mathematical procedures by using number relationships and operations.
- Students will recognize patterns, functions and algebraic equations for a given scenario.
- Students will be able to analyze data to solve business/consumer-related problems.
- Students will demonstrate a developmental approach to the acquisition of computation skills.
- Students will be informed and prepared to be prudent managers of financial resources, enabling them to achieve long- and short-term financial goals and security.
- Students will be engaged in establishing career goals that will provide adequate income and personal fulfillment.
- Students will demonstrate an understanding of personal financial planning and sound money management skills.
- Students will actively participate in and understand management of personal savings and investments.
- Students will accept responsibility for and understand personal and societal consequences of financial decisions.

CORE STANDARDS AND OBJECTIVES

STANDARD 1

Students will use a rational decision-making process to set and implement financial goals.

Objective 1: Explain how goals, decision-making, and planning affect personal financial choices and behaviors.

- a. Discuss personal values that affect financial choices (e.g., home ownership, work ethic, charity, civic virtue).
- b. Explain the components of a financial plan (e.g., goals, net worth statement, budget, income and expense record, an insurance plan, a saving and investing plan).
- c. Compare short-term, mid-term, long-term and retirement financial goals for consumers and businesses.
- d. Design a plan to reach a specific financial goal.
- e. List advantages of designing and following a personal financial plan.
- f. Understand what a business financial plan is and how it works.

Objective 2: Analyze the role of cultural, social, and emotional influences on financial behavior.

- a. Explain how limited financial resources affect the choices people make.
- b. Describe the influence of peer pressure as it relates to purchasing decisions (e.g., fashion, acceptance from others, need for the latest gadget).
- c. Explain how scarcity relates to needs and wants.
- d. Analyze the impact of marketing, advertising, and sales strategies/techniques on purchasing decisions (e.g., impulse buying, delayed payment).
- e. Evaluate the role of emotions when making financial decisions.

Objective 3: Relate financial decisions to personal, business and societal consequences.

- a. Recognize that individuals are responsible for their finances.
- b. Describe consequences of excessive debt (e.g., increased consumer costs, inflation, deflation, family instability).
- c. Describe the social and economic consequences of personal and business bankruptcy.

STANDARD 2

Students will use mathematical calculations to solve problems.

Objective 1: Students will solve problems involving whole numbers, decimals, fractions, percent, ratios, and proportions.

- a. Setup and solve problems that involve percent, ratios, and proportions and use appropriate conversions (e.g., decimals to percent, percent to decimals, or ratios to percent).
- b. Use percentage formulas to solve practical problems in business and consumer-related problems.
- c. Solve problems involving percentage increase and decrease.

Objective 2: Use algebraic operations to solve problems.

- a. Construct and solve an algebraic equation for a given problem (e.g., simple interest, compound interest, sales tax, unit pricing, markup/markdown, percentage formula).

- b. Apply the order of operations principle when using mathematical processes (e.g., multiply/divide before adding, multiple/divide before subtracting, and complete operations in parentheses first).
- c. Solve for the missing variable in formulas (e.g., simple interest, compound interest, sales tax, unit pricing, markup/markdown, percentage formula).

STANDARD 3

Students will understand and calculate sources of income and the relationship between income and career preparation.

Objective 1: Identify various forms of income and analyze factors that affect income.

- a. Identify sources of income (e.g., wages, investments, and self-employment).
- b. Calculate gross pay per pay period (e.g., salaries, wages, commissions, overtime, tips, and piece-rate).
- c. Compare common employee benefits (e.g., health insurance, leave, retirement, unemployment insurance, workers' compensation).
- d. Compare income to the cost-of-living in various geographical areas.
- e. Analyze how economic conditions affect income and expenses.

Objective 2: Identify and understand required income withholdings.

- a. List the reasons for taxation and uses of tax revenues.
- b. Describe the purposes of and calculate Social Security and Medicare taxes.
- c. Calculate federal, state and local payroll deductions by referencing tax charts and tables.
- d. Calculate net income from an employee payroll record.
- e. Demonstrate how to complete personal state and federal income tax returns, W-4 and I-9 forms.

Objective 3: Analyze criteria for selecting a career and the impact of career choices on income and financial stability.

- a. Describe the correlation between income and a worker's skills, education, the value of the work to society, condition of the economy, and the supply and demand for workers.
- b. Develop career plan(s) that include educational requirements, skill development, and income potential.
- c. Analyze the costs and benefits of developing new skills for the workplace.
- d. Identify the risks and rewards of entrepreneurship/self-employment.
- e. Compare salary vs. hourly career opportunities using data from charts/tables (e.g., mean, median, mode, range, outliers).

STANDARD 4

Students will understand principles of money management.

Objective 1: Describe the role of planning and maintaining a balanced budget.

- a. Develop, monitor, and evaluate a personal budget.

- b. Discuss opportunity costs and trade-offs in budget implementation.
- c. Identify and discuss the social, business and personal consequences of not following a budget.
- d. Compare and evaluate various tools available for keeping track of budgets (e.g., envelope systems, computer programs, paper tracking, and digital apps).
- e. Demonstrate knowledge of financial transactions, checking and savings accounts, and associated financial services.
- f. Comparison of purchase costs using cash, check, debit cards, smart cards, credit cards and store cards.
- g. Maintain a check register and reconcile a bank statement.
- h. Evaluate the impact and related expenses of major purchases on budgeting (e.g., sales tax, property tax, registration, accessories).
- i. Be able to graph the income and expense portions of budgets using pie charts, line graphs, bar graphs, etc.

Objective 2: Understand credit uses and costs from a business and consumer perspective.

- a. Discuss the history and role of credit.
- b. List basic types of credit (e.g., credit cards, installment loans, service credit, revolving credit, student loans, payday loans).
- c. Describe the risks and responsibilities associated with using credit.
- d. Identify methods of establishing and maintaining a good credit rating.
- e. Explain the purpose of co-signers and collateral when applying for a loan.
- f. Identify warning signs of credit abuse (e.g., late fees, missed payments, collection notices, bounced checks) and ways to correct credit problems.
- g. Calculate, analyze and compare costs associated with the use of credit (e.g., finance charges, interest, late fees, default rates, closing costs).

Objective 3: Describe the impact of credit on money management from a business and consumer perspective.

- a. Compare the advantages and disadvantages of different payment methods.
- b. Understand the merchant fees related to accepting debit and credit cards.
- c. Compare the services of various types of financial institution (e.g., banks, credit unions, investment brokers, loan agencies, title loans, payday loans).
- d. Identify advantages of comparison shopping before selecting financial services and purchases.
- e. Describe the relationship between a credit rating, credit risk, the cost of credit, and factors that affect credit worthiness.
- f. Explain the value of credit reports and scores to borrowers and lenders.

- g. Calculate how long it takes to repay debt (short- vs. long-term loans).
- h. Calculate the total costs when a borrower makes only minimum payments.

Objective 4: Describe the rights and responsibilities of businesses and consumers under consumer protection laws.

- a. Explain the purposes and features of consumer protection laws, agencies, and sources of assistance.
- b. Describe ways to avoid identity theft and fraud (e.g., keep Social Security numbers secure, properly dispose of outdated documents).
- c. Understand avoidance and recovery costs related to identity theft and fraud (both tangible and intangible).
- d. Explain the importance of understanding financial contracts (e.g., disclosure information, grace period, payment penalties, methods of interest calculation).
- e. List possible actions that can be taken in response to excessive debt and collection practices (e.g., sell assets, negotiate a repayment schedule).
- f. Describe ways to avoid financial scams and schemes designed to defraud consumers (e.g., Ponzi and pyramid schemes, affinity fraud).

Objective 5: Discuss the purposes of insurance and risk management.

- a. Identify and calculate common types of insurance (e.g., automobile, health, homeowner's, renter's, reverse mortgage, life, long-term disability).
- b. Understand insurance terminology (e.g., term, whole life, deductible, premium, grace period, and beneficiary).
- c. Describe how insurance and other risk-management strategies protect against financial loss.
- d. Discuss and calculate life insurance needs at various life stages and lifestyles (e.g., gender, smoking, genetics, grades, age, and marital status).
- e. Identify the importance of estate planning (e.g., wills, trusts).
- f. Discuss and calculate the consequences of being under-insured.

STANDARD 5

Students will understand saving, investing, and retirement planning.

Objective 1: Describe the value of saving in the financial planning process.

- a. Identify vehicles to save for short- and long-term financial goals (e.g., automatic payroll deduction to savings account, certificate of deposit, mattress, money market accounts).
- b. Analyze reasons to save (e.g., emergencies, job loss, college, home, retirement).
- c. Explain how government regulations protect savers (e.g., FDIC, NCUA, FSLIC).

Objective 2: Describe the value of investing and types of investments in the

financial planning process.

- a. Identify and explain types of investment vehicles (e.g., mutual funds, stocks, bonds, real estate, precious metals).
- b. Identify strategies for investing (e.g., diversification, dollar-cost averaging, levels of risk).
- c. Compare long-term and short-term investments (e.g., day trading, flipping houses, 401k, IRA).
- d. Explain how government regulations can protect investors (e.g., SEC, SIPC).
- e. Compare various sources of investment information (e.g., prospectuses, annual reports, financial publications, online information).
- f. Identify ways to buy/sell investments (e.g., full service and discount brokers, investment advisors, online brokers).

Objective 3: Compare savings and investments.

- a. Compare and calculate the risk, return, liquidity, and costs for savings and investments (e.g., P/E ratio, dividend yield).
- b. Explain the effects of inflation on savings and investments.
- c. Calculate and understand the concept of the time value of money (e.g., simple and compound interest, Rule of 72).
- d. Analyze the relationship between risk and return.
- e. Describe appropriate financial products for different financial goals (e.g., savings accounts, stocks).

Objective 4: Analyze financial preparation for retirement.

- a. Discuss and calculate financial resources needed for specific retirement activities and lifestyles.
- b. Compare the characteristics of retirement plans (e.g., individual, employer sponsored, Social Security).
- c. Compare and contrast tax-free vs. tax-deferred retirement plans.
- d. Evaluate the role of individual responsibility in planning for retirement.
- e. Analyze the power of compound interest and the importance of starting early in implementing a financial plan for retirement.

STANDARD 6

Students will be able to solve various sales and marketing discounts and markup/markdown computations.

Objective 1: Calculate different types of discounts involved in purchasing.

- a. Use a single trade discount rate to determine the trade discount amount and net price.
- b. Use a chain trade discount to find the net price, equivalent rates, and discount amount.
- c. Use cash discounts to calculate the discount period(s), credit period, and payment amounts (ordinary, special).

Objective 2: Calculate the percent of markup/markdown based on the cost and the selling price with fixed and variable costs included.

- a. Understand the reasoning for markup and markdown and when

- each is appropriate.
- b. Use markups based on cost to establish the cost, dollar markup and selling price.
- c. Use markups based on selling price to determine the cost, dollar markup and selling price.
- d. Figure the markdown on discounted products based on selling price.
- e. Calculate the price to charge for perishable items.
- f. Analyze break-even point and when it may be appropriate to markdown below cost.

STANDARD 7

Students will understand and be able to calculate depreciation expense, accumulated depreciation, and book value.

Objective 1: Understand the purpose and causes of depreciation.

- a. Understand how salvage value and asset life impacts calculations.
- b. Define fixed asset.
- c. Compare book value vs. market value.

Objective 2: Calculate annual and accumulated depreciation or the recovery cost of a fixed asset using the following methods:

- a. Straight-line method
- b. Units of production method
- c. Sum-of-the-year's digits method
- d. Double declining balance method
- e. IRS method

STANDARD 8

Students will understand and calculate the cost of home/business ownership.

Objective 1: Understand the elements related to the total cost of a monthly mortgage payment.

- a. Understand the components involved in a principal loan amount calculation (e.g., loan, closing costs, down payment).
- b. Define the purpose of an escrow account (e.g., property taxes and homeowner's insurance).
- c. Analyze how interest rate and length of loan affect payment.
- d. Understand how to calculate, read and interpret a mortgage amortization schedule.
- e. Identify when mortgage insurance premiums are required and how these premiums affect payment amount.
- f. Understand different types of mortgages (e.g., ARM, Balloon, Home Equity Line).

Objective 2: Calculate the costs associated with mortgages.

- a. Calculate how principal and interest are allocated in a monthly payment.
- b. Calculate the total interest and total cost paid over the life of a loan.
- c. Compute closing costs (e.g., title search, realtor, appraisal, HOA

transfer).

- d. Calculate amount required for down payment given certain percentages.

Objective 3: Understand related costs associated with renting vs. home/business ownership.

- a. Discuss homeowner association fees and typical inclusions.
- b. Identify costs related to home improvement/repair.
- c. Recognize typical requirements for furnishing and landscaping.
- d. Understand obligations for utilities (gas, power, Internet, cable, water, sewer, garbage).

STANDARD 9

Students will understand how to calculate inventory using different systems and the reasons behind each system.

Objective 1: Recognize the purposes for and differences between perpetual and periodic inventory control systems.

Objective 2: Calculate ending inventory and cost of goods sold using a variety of methods.

- a. Calculate inventory using the Weighted Average method.
- b. Calculate inventory using Last-in, First-out method.
- c. Calculate inventory using First-in, First-out method.
- d. Discuss how damaged, stolen, and returned merchandise affects these calculations.